

FIG. 1
 PRIOR ART

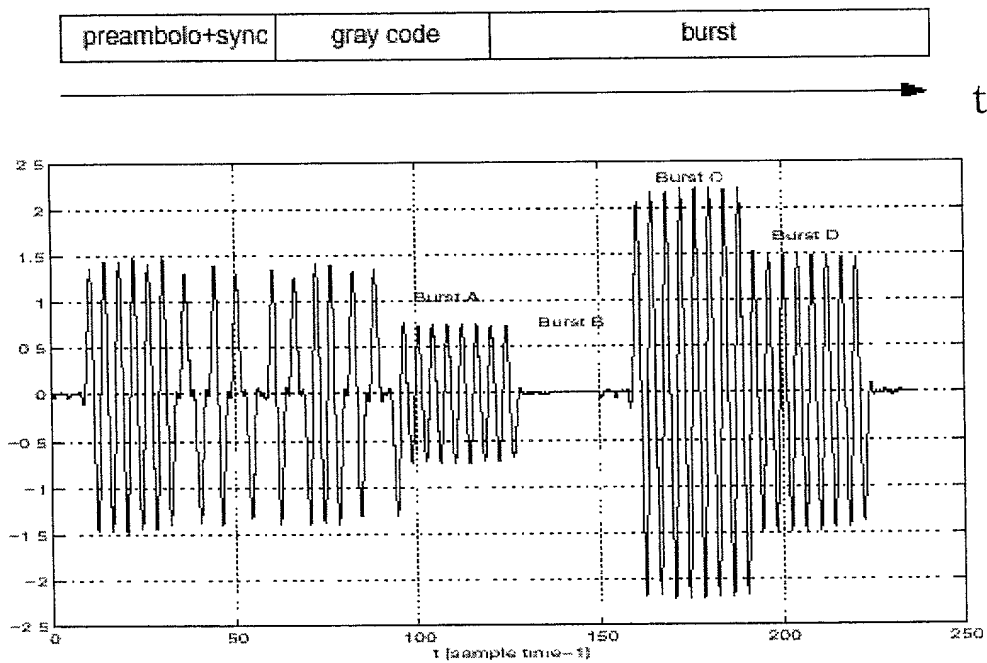


FIG. 2
 PRIOR ART

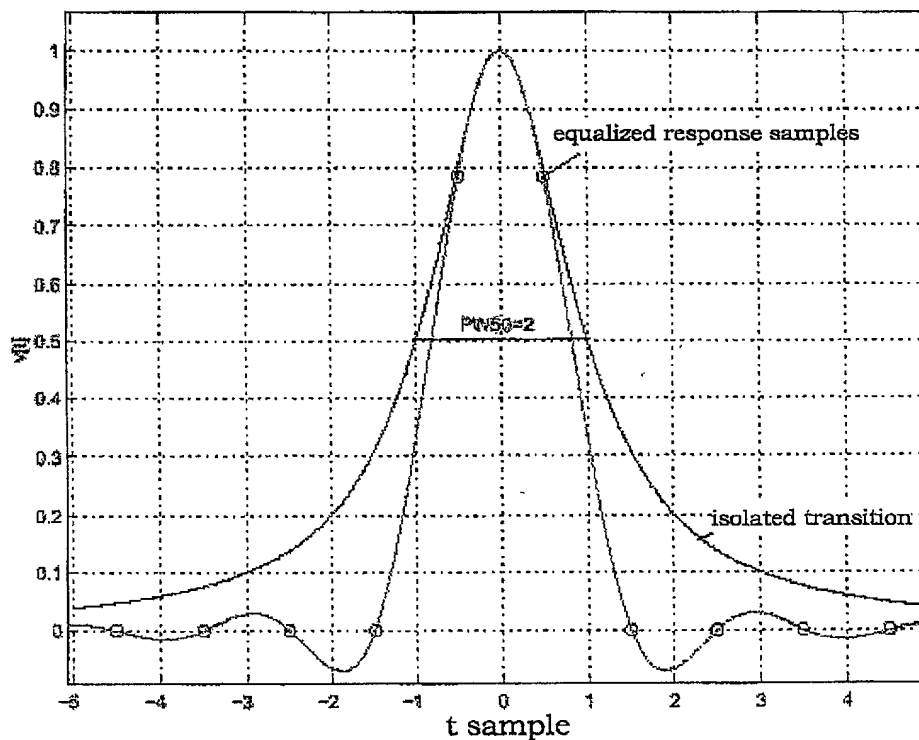


FIG. 3
PRIOR ART

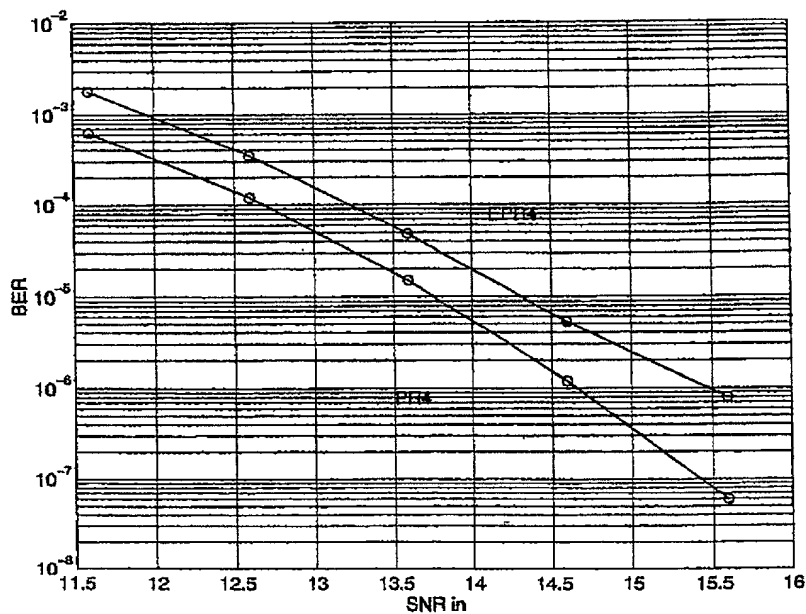


FIG. 4
PRIOR ART

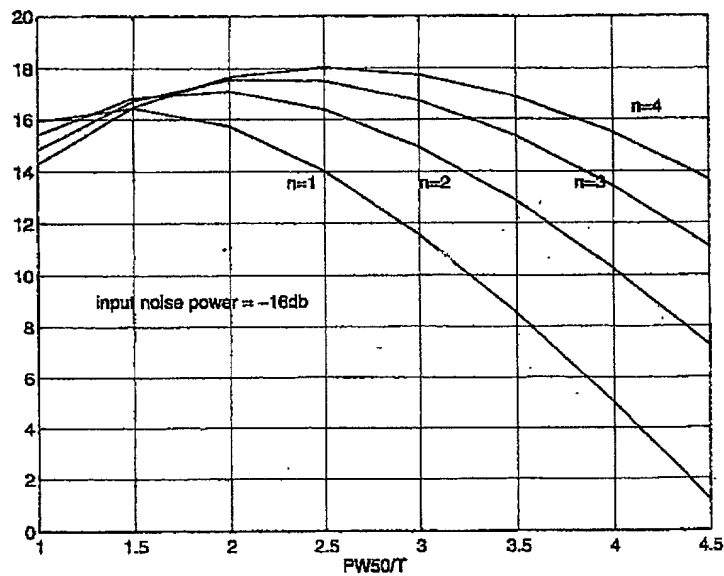


FIG. 5
 PRIOR ART

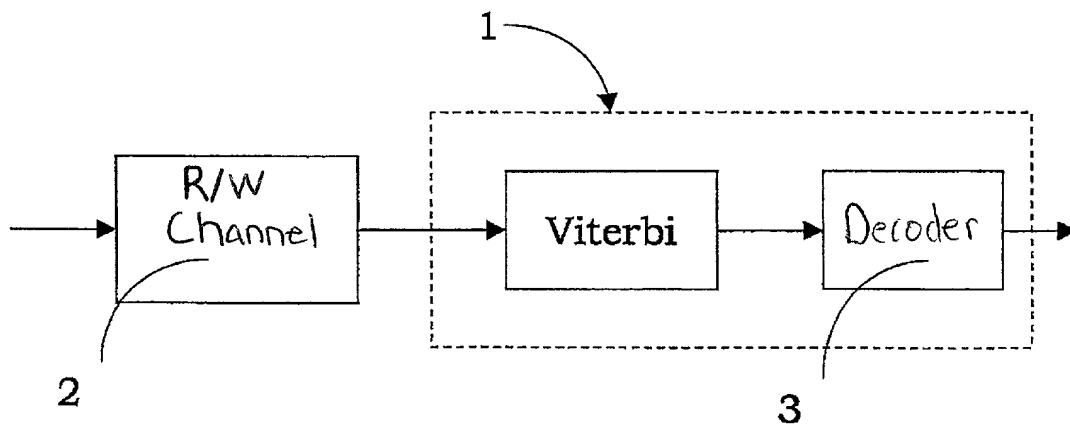


FIG. 6A

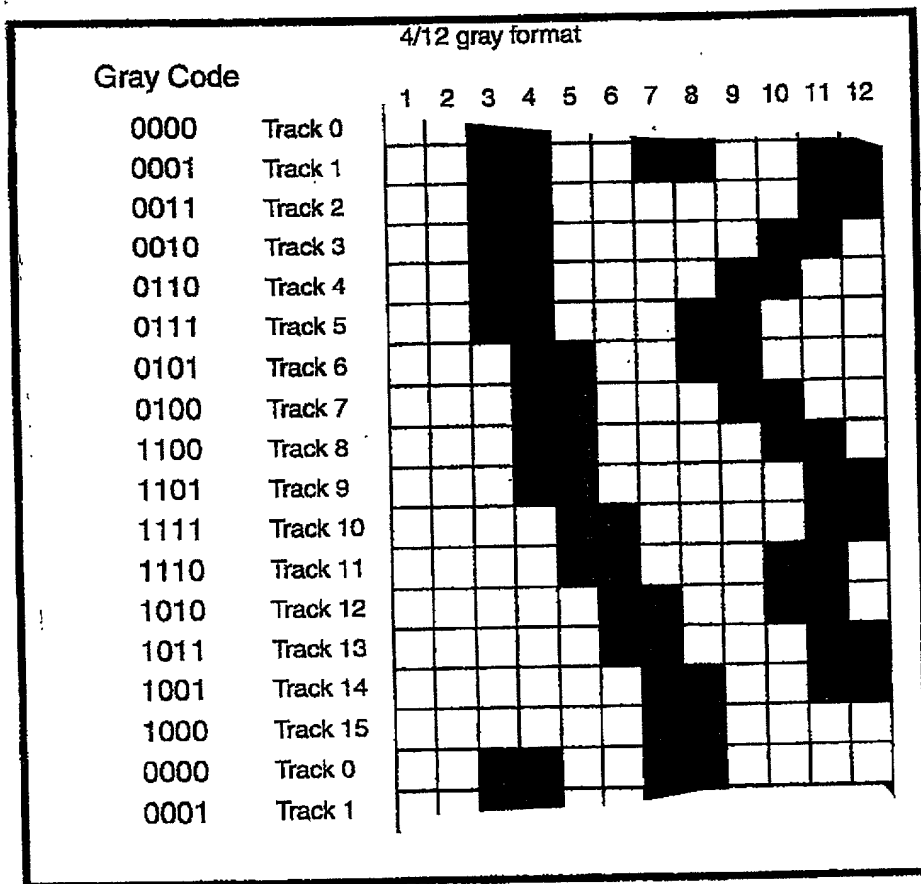


FIG. 6
PRIOR ART

Uncoded 4 bits word	Coded pattern
0000	001100110000
0001	001100110011
0010	001100000110
0011	001100000011
0100	000110001100
0101	000110011000
0110	001100001100
0111	001100011000
1000	000000110000
1001	000000110011
1010	000001100110
1011	000001100011
1100	000110000110
1101	000110000011
1110	000011000110
1111	000011000011

FIG. 8
PRIOR ART

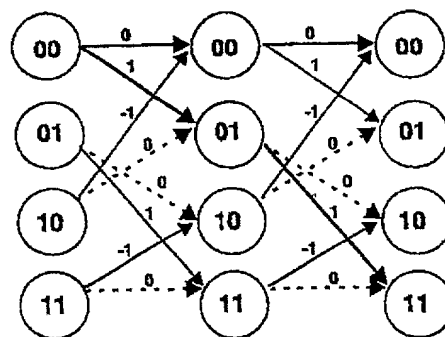


FIG. 7
PRIOR ART

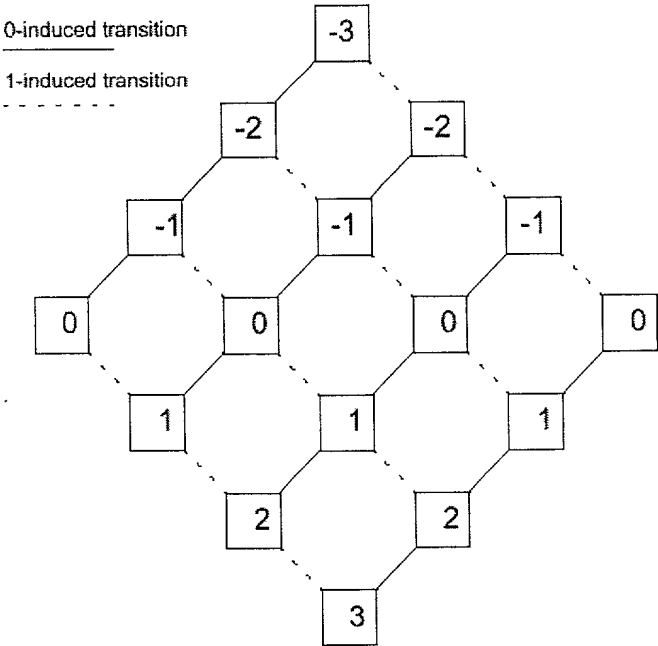


FIG. 9

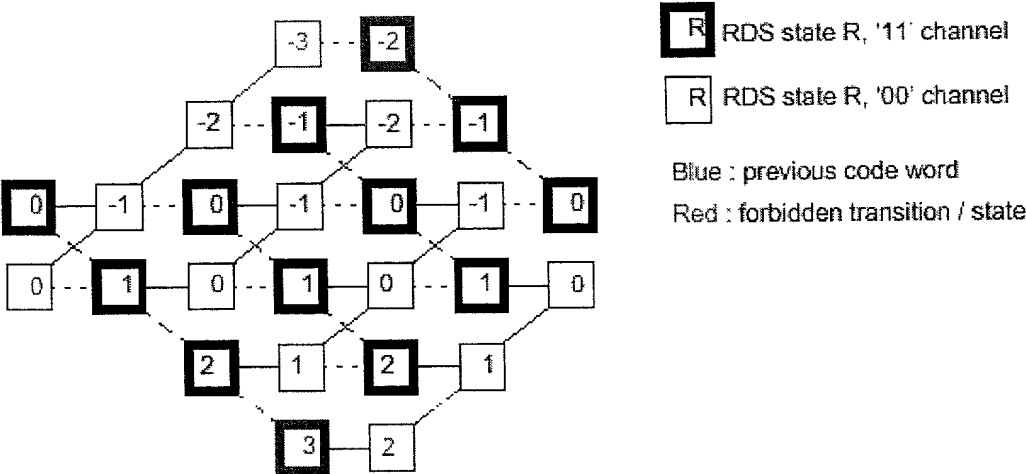


FIG. 10

Encoder

```
switch( gray_in ) {
    case 4'b0000: msn = 6'b001011;
    case 4'b0001: msn = 6'b001110;
    case 4'b0011: msn = 6'b011010;
    case 4'b0010: msn = 6'b010011;
    case 4'b0110: msn = 6'b010110;
    case 4'b0111: msn = 6'b011100;
    case 4'b0101: msn = 6'b001101;
    case 4'b0100: msn = 6'b011001;
    case 4'b1100: msn = 6'b110001;
    case 4'b1101: msn = 6'b010101;
    case 4'b1111: msn = 6'b110100;
    case 4'b1110: msn = 6'b100101;
    case 4'b1010: msn = 6'b101100;
    case 4'b1011: msn = 6'b100110;
    case 4'b1001: msn = 6'b100011;
    case 4'b1000: msn = 6'b101001;
}

assign
    cw_out={2'b{msn{5}},2'b{msn{4}},2'b{msn{3}},2'b{msn{2}},
    2'b{msn{1}},2'b{msn{0}}};
```

FIG. 11

Decoder

```
assign cw_in={ msn{10}, msn{8}, msn{6}, msn{4},
    msn{2}, msn{0}};

switch( msn ) {
    case 6'b001011: gray_out = 4'b0000;
    case 6'b001110: gray_out = 4'b0001;
    case 6'b011010: gray_out = 4'b0011;
    case 6'b010011: gray_out = 4'b0010;
    case 6'b010110: gray_out = 4'b0110;
    case 6'b011100: gray_out = 4'b0111;
    case 6'b001101: gray_out = 4'b0101;
    case 6'b011001: gray_out = 4'b0100;
    case 6'b110001: gray_out = 4'b1100;
    case 6'b100101: gray_out = 4'b1101;
    case 6'b101100: gray_out = 4'b1111;
    case 6'b100110: gray_out = 4'b1110;
    case 6'b101001: gray_out = 4'b1010;
    case 6'b100011: gray_out = 4'b1001;
    case 6'b101000: gray_out = 4'b1000;
    default: gray_out = 4'b0000;
}
```

FIG. 12

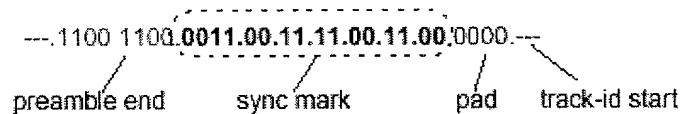


FIG. 14

FIG. 13

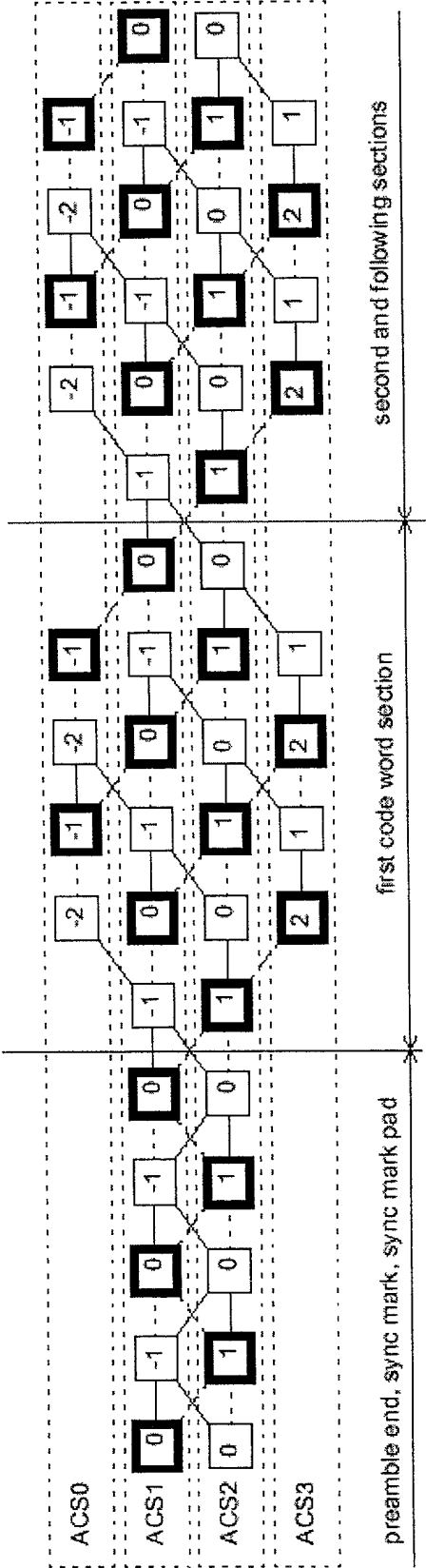


FIG. 13

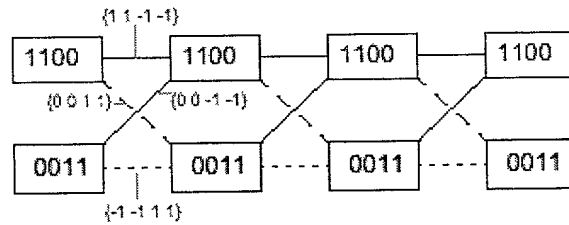


FIG. 15

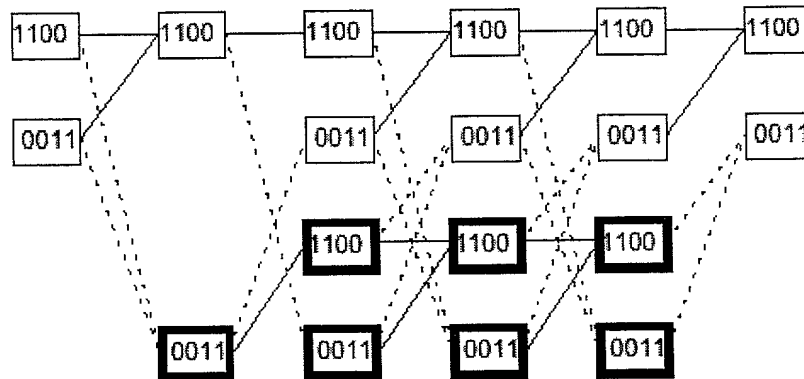


FIG. 16